

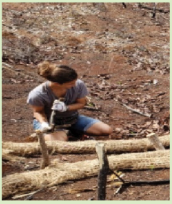
Man, Land, & Sea

A publication by Guam Coastal Management Program

May 1, 2020



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Protecting Guam from Ridge to Reef



Office of the Speaker
TINA ROSE MUNA BARNES
I Minna Trentai Singko Na Liheslaturan Guahan

03/03/2020



From the Speaker's Desk

Hafa Adai! Earlier this term, the 35th Guam Legislature made strides by introducing numerous Bills and Resolutions to protect our most valuable resource – our environment. With the partnerships I have within this Legislative body, I am honored to be a part of a dynamic group of policymakers who see the bigger picture – that making environmentally conscious decisions is the greatest gift we can possibly give our future generations.

After 16 years, this body has finally adopted the Rules and Regulations of the Recycling Revolving Fund. By establishing the parameters of the Recycling Revolving Fund, we can finally see the much-needed improvement to our community. The work doesn't stop there however – in the coming days, this body, through the stewardship of Senator Sabina Perez, we will be introducing the Guam Zero Waste Plan, which intends to serve as a cost-effective means of preserving resources and building resiliency against the negative impacts of climate change.

Included in this plan, along with many possibilities to make our Island cleaner, greener, and more sustainable is the implementation of my Bottle Bill. Known as the Guam Beverage Container Recycling Act, I laid the foundation to reduce the amount of waste on our island. It is unfortunate that the previous administration did not see this program as something that is viable for our island. With this new Zero Waste plan, we intend to provide seed funding to launch the Guam Beverage Container Recycling program within the next two years. I am grateful for the opportunity to serve our community and look forward to making our island a better place for all that call this beautiful island paradise home.

Sincenru yan Magahit,

Tina Rose Muna Barnes
Speaker, 35th Guam Legislature

Speaker's MESSAGE

“ ..making environmentally conscious decisions is the greatest gift we can possibly give our future generations. ”





Post-fire Recovery- One Tree at a Time

GUAM DEPARTMENT OF AGRICULTURE,
FORESTRY AND SOIL RESOURCES DIVISION

By: *Christine Camacho Fejeran*
December 10, 2019



The 2019 dry season on Guam, resulted in record high wildfire numbers and acreage burned. Approximately 9,218-acres were burned from January – September 2019, which is about 7% of our total area island-wide. This is significant. On June 16, 2019, a wildfire was set behind the COTAL Conservation Area between Leo Palace and Cross Island Road, Rt. 17, and burned over 200-acres of forest and savannah lands. The 40-year old forestry plantation was significantly impacted by the wildfire and much of the trail leading toward Tarzan Falls was burned. The Guam Power Authority's wind turbine project site was also threatened, but the firebreak and efforts of the Guam Forestry wildland firefighters and responding unit from GFD ensured the safety of the site. After the fire, Guam Forestry called out for volunteers and various community members answered the call.



Volunteers from Mañelu, Guam Community College, AmeriCorps Guam, Serve Guam Commission, University of Guam, the Office of Senator Ridgell, civic groups and families from all across the island responded and came out to help. Volunteers refused to accept and ignore the damage, and instead, worked together and conducted post-wildfire recovery tree plantings. A total of 1,676-hours of community service and effort were logged from the efforts of 344 volunteers. In place of the charred earth, volunteers planted over 4,000 native trees to outcompete the intrusion of nuisance and invasive grasses that are dominating our southern landscapes. Wildfires changed the landscape by converting vegetation from preferred native species to less desirable grass species which are more fire-prone and help move

fire across the land and closer and closer to our surrounding village because on the other side of every grassland and or jungle patch lies a residence, street and village. These wildfires won't stop until we all acknowledge and commit to doing our part to prevent human-caused wildfires... anything suspicious, do your part and report it 864-TOKA (8652).

“These wildfires won't stop until we all acknowledge and commit to doing our part to prevent human-caused wildfires...”

Remember – *Munga masongge Guahan, Don't burn Guam!*



Here are some fire safety tips to ensure you don't become part of the wild-fire problem:

- ▶ Burning without a permit is prohibited. Should you obtain a permit, don't burn when it's windy or when vegetation is very dry.
- ▶ Make sure you use a burn barrel made entirely of metal with at least three evenly-spaced, three-inch, screened vents and metal top screen to avoid the spread of embers.
- ▶ Do not burn household trash, plastic, tires or recyclable products.
- ▶ Look up. Choose a safe burning site away from powerlines, overhanging limbs, buildings, vehicles and equipment. You'll need at least three times the height of the pile of vertical distance.
- ▶ Look around. The site should be surrounded by gravel or mineral soil (dirt) at least 10 feet in all directions. Keep surroundings watered down during the burn and have a shovel close by.
- ▶ Never leave a fire unattended.
- ▶ Drown the fire with water. Turn over the ashes with a shovel and drown it again. Repeat several times.

This is in no way an endorsement for burning but our community is set on using fire and it's time we started providing safer burning tips for when burn permits are issued.



YOUTH Environmental Stewardship Outreach

A Partnership to Restore Habitats

Over 160 Inarajan Middle School (IMS) students participated in a Youth Environmental Stewardship Outreach program held in January. The program is the product of a partnership between the Department of Agriculture's Division of Aquatic and Wildlife Resources & the Division of Forestry, Coral Reef Conservation Program, University of Guam Marine Lab and the Bureau of Statistics and Plans, Guam Coastal Management Program.

Guided by natural resource managers, the students, along with their teachers went on nature hikes to learn about Guam's southern landscapes in the Manell Geus, Toguan, Fouha Bay, and Piti Asan watersheds. They saw first-hand the effects of recreational activities, land-based sources of pollution, wildfires, and invasive plant and animal species on terrestrial and marine ecosystems. While immersed in the natural environment, they were presented with actions to prevent impacts in the watershed and how they can participate to restore habitats. The students submitted reflection essays about their experiences of the 3-day field trip. Each essay contained positive feedback and some provided solutions to address environmental impacts. Featured here are some inspiring quotes from the IMS students.

"Island sustainability is important because we need to keep our resources clean, alive, and healthy for the new generations."

-Jewels, IMS Student



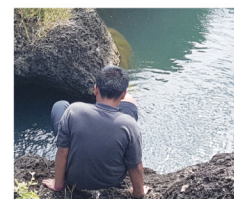
"If we don't do something to help the earth now, then sooner or later we are going to pay the consequences and we aren't going to like it."

-Aydria Sanches, IMS Student



"I was taught the importance of land, ocean, rivers, trees, etc... I truly believe that my generation should make a difference so that the next generation can see and experience these beautiful resources."

-Kaylean Rivera, IMS Student



"These field trips were amazing... encouraged me to care about our island. I had so much fun. I will tell everybody what I saw and learned."

-Merlen, IMS Student





5TH Annual

Assembly of Planners Symposium 2020



CREATING A CLEAR VISION IN A CHANGING CLIMATE



Opening Remarks

The Honorable Lourdes A. Leon Guerrero,
Governor of Guam

The Flood Control Session, moderated by Marie Auyong, NOAA Coastal Zone Management Liaison discussed real life scenarios of flooding issues around the island. Agencies provided an overview of mandates and the challenges and gaps with managing floods as well as offering potential solutions for flooding on Island.

(Seated L-R) Masoud Teimoury, P.E., Ph.D. Chief of Engineering, Department of Public Works; CDR Brian G. Bearden, P.E., BCEE, Chief Engineer, U.S. Public Health Service; Paul Santos, Chief of Cadastre, Department of Land Management; Celine Cruz, Territorial Chief Planner, Department of Land Management



“Creating a Clear Vision in a Changing Climate” was this year’s theme for the 5th annual Assembly of Planners Symposium. The Bureau of Statistics and Plans Guam Coastal Management Program, in partnership with the National Oceanic and Atmospheric Administration Office for Coastal Management, and the Office of the Governor hosted the one-day event with more than 200 in attendance at the Dusit Thani Resort on Thursday, February 20, 2020.



Keynote Speaker

The Honorable Joshua F. Tenorio,
Lieutenant Governor of Guam

The symposium centered on land and natural resource issues that could be resolved or at least contribute to solutions through collective efforts of Guam’s planning, resource management, and policy communities. Attendees were presented with topics ranging from flooding

scenarios, flood control strategies, coastal decision support tools, to Guam’s first biosolids composting project. For more information on the presentations please visit:

<https://bsp.guam.gov/information-transfer-outreach-program>



Welcome Remarks

Tyrone Taitano,
Director, Bureau of Statistics and Plans

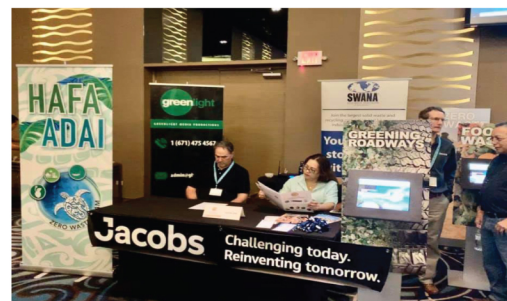


Chelsa Muña-Brecht, Director of Guam Department of Agriculture and Jathan Muna Barnes, Land Use Planner for the Guam Coastal Management Program presented the **Guam Forest System Plan**. Authorized by the Legacy Act of Guam, the plan provides the ability to work across government agencies to ensure Guam’s critical forests ecosystems are managed and protected.

“ **Creating a Clear Vision with a Changing Climate is not only timely but also underscores our Administration’s efforts to tackle head-on the needs of today and long-term challenges of the future, specifically sustainable development and climate change.** ”

– Governor Lou Leon Guerrero

Several Exhibitors provided demonstrations and presentations on specific working projects, such as the newly formed Zero Waste Working Group on composting and biosolids projects.





Over 200 in attendance at the 5th Annual Assembly of Planners. Attendees represented various Federal and Government of Guam agencies, private sector employees and planners.



“ Our island has many challenges before us and we can address them in the near term, but ultimately, we are not going to solve them unless we take the long-term view incorporating the needs of the next generation or even the next century. As an island community we are starkly aware of the limits on our available resources.

Whatever the future may hold, whether it be social, economic, or natural resource planning, we must prepare and incorporate one central principle – Sustainability.”

Lt. Governor Joshua F. Tenorio

Cory Hinds, P.E., Project Manager for Jacobs discusses the **Guam Food Waste Report & Food Recovery Opportunity**, a new food recovery project between the Hyatt Regency Guam, Salvation Army, and the Guam Department of Public Health and Social Services. The pilot program would provide safe DPHSS approved take-away meals for charity organizations from the hotel's excess daily food.



Jay R. Merrill of Market Research Development (MRD) shared the findings from a recent study on barriers to public shoreline access, affirming: “Public access is inevitably going to grow, both in terms of resident population, development, and in the total number of visitors to the island. If nothing is done to address the issues of growth, the quality of access will decline even further. Public access must be addressed as an important component when planning for growth.”

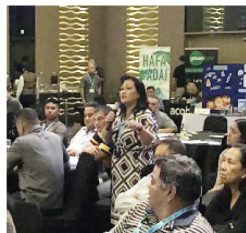


Jeff Herzog, USACE Silver Jackets Coordinator discusses **The Guam Silver Jackets Interagency Working Group partners and projects** which includes the Bureau of Statics and Plans, Department of Land Management; Department of Public Works, Office of Civil Defense, Guam EPA, University of Guam, NOAA, FEMA, and the US Army Corps of Engineers.

The vision of the working group is to serve as a catalyst in developing comprehensive and sustainable solutions to Guam's hazard issues, including mitigation planning, flood hazard mapping, risk reduction activities, response and recovery planning, community resilience, and climate change adaptation in the Territory of Guam.



Esther Taitague, Guam Coastal Management Program Planner presented examples on ways to see our landscape through a compressive lens utilizing Decision Support Tools - **Digital Coast Solutions**.



Evangeline D. Lujan, Chair, **Climate Change Resiliency Commission** poses a question to panelists.



Edwin Reyes, Administrator, Guam Coastal Management Program; Governor Lou Leon Guerrero and Tyrone Taitano, Director of BSP.



Guam Coastal Management Program staff take a moment to capture a group photo after a successful Assembly of Planners Symposium.



\$3M FLOOD STUDY FOR HAGĀTÑA RIVER



Governor Lou Leon Guerrero and U.S. Army Corps of Engineers Honolulu District Commander Lt. Col. Kathryn Sanborn sign the Agana River (Hagåtña River Flood Control) flood risk management study.

Because of concerns about flooding from the Agana River, development in Hagåtña has long been burdened with flooding regulations. A new study by the US Army Corps of Engineers (USACE) may change all that. The \$3 million study is 100% federally funded and will be managed by the USACE Honolulu District. Most of Hagåtña has been designated as a flood zone by FEMA since the 1970s. However, Gov. Leon Guerrero emphasized that “a (flood) study was done nearly 30 years ago, but we want to revisit the process and see if that information is still applicable. I want the people of Guam to know the importance of this (agreement) as we’ve been trying to revitalize Hagåtña. This feasibility study will be able to reveal some of those challenges with the way river flows, which hampers any kind of expansion with our businesses.”

A lot has changed over the past 30 years, and this study will incorporate new technology that will allow USACE Coastal Engineers to look at this watershed in ways that were not possible before. Working with various Government of Guam agencies, USACE will assess significant flood inundation damages or other impacts of flooding such as road closures within the Agana River floodplain during and after recent tropical cyclones, including significant flooding issues in the downtown Hagåtña area and damages to public infrastructure, homes, and business. Tyrone Taitano, Director of the Bureau of Statistics and Plans stated: “Any discussions regarding the revisions in Hagåtña or expansion of the economic potential has always been the Agana River and the concerns about flooding. The big advantage of the study that the Army Corps of Engineers is embarking on is that it will inform future decisions moving forward and give us a path forward to get past that obstacle.”

Mr. Edwin Reyes, Administrator for Guam Coastal Management Program, and Point of Contact for USACE projects with the Government of Guam stated that “part of the study requirements will be to assess if there is a federal interest based on a federally prescribed benefit-cost analysis process. If the outcome of the benefit-cost analysis is positive, this would make the project eligible for US Congressional support to fund the design and construction of the project. Regardless of the outcome, the study will be a tremendous value to the people of Guam. We will have updated hydraulic and hydrological data and understand the true floodplain as well as have a technical report that will provide an environmental assessment, flood mitigation, and design options that can be used in Capital Improvements Projects planning.”



Present for the signing: (L-R) USACE Honolulu District, Deputy District Engineer, Steve Cayetano; Lt. Col. Sanborn; Gov. Leon Guerrero; Tyrone Taitano, BSP Director; Vince Arriola, DPW Director; (Back L-R) Esther Taitague, BSP-Guam Coastal Management Program Planner; Celine Cruz, Territorial Chief Planner, Department of Land Management, and Masoud Teimoury, Chief Engineer, DPW.

ZERO WASTE GUAM

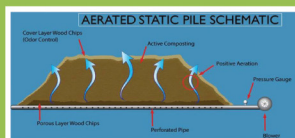
Biosolids Composting Demonstration Project

Introduction

GovGuam, via Guam EPA and the newly formed Zero Waste Working Group, is working on a series of initiatives to reduce landfill waste. Currently over 8,000 tons of dewatered wastewater solids, also known as biosolids, are disposed annually in the landfill, and this amount is expected to increase.

The purpose of this pilot scale project is to demonstrate that Guam’s wastewater solids can be composted with locally-available wood chips to produce a beneficial compost product meeting all testing requirements for use in landscaping, horticulture, and agriculture on Guam.

Demonstration Details



The aerated static pile (ASP) method, using electric blowers to actively move air through the compost pile, was used for the demonstration to simulate the recommended method for full-scale composting. The advantage of this composting method is faster production on a smaller site footprint.

The composting demonstration pile consisted of three distinct materials:

- a base of ground, untreated pallets (wood chips) used to promote air flow in the pile
- a mixture of ground, untreated pallets (wood chips) and dewatered biosolids, and
- a ground green waste cover material



Mixing of wood chips and biosolids was done with a front-end loader. A small electric blower provided positive airflow through the pile via a plenum of perforated pipes. The blower was powered by small gasoline generator.

LMS monitored and recorded temperatures daily at four different locations in the pile during the active composting period, and every other day at two locations in the pile during the curing period. The active composting period was approximately 4 weeks starting in mid January 2020, followed by screening and a 4 week curing phase. Water was added to the pile twice during the active composting process. US EPA requirements for time and temperature were easily met within the active composting period.

Preliminary testing of the biosolids indicated low levels of metals and per- and poly-fluorinated alkyl substances (PFAS) that are not expected to be a concern to human health or the environment. The finished product will be tested for metals, pathogens, nutrients, and PFAS once the COVID-19 restrictions are lifted.



Conclusions

The composting demonstration process was successful using local feedstock and equipment to achieve the required time and temperature requirements for pathogen kill and vector attraction reduction. A similar process should be able to achieve these same results at full scale. Supplemental water may be required to keep moisture content within optimal range.

Next steps

Testing results will be used by Guam EPA to approve the compost for growth studies. The long-term project goal is diversion of all biosolids from landfill disposal, and recovery as a resource in a full-scale composting facility offering reduced solids disposal costs for GWA. Accordingly, Jacobs will prepare a concept design and cost estimate for construction of a full-scale biosolids composting facility.

Thanks to our community partners:

Port of Guam for providing access to the secure site
GWA for providing data and delivery of biosolids
LMS for providing equipment for mixing, screening, and monitoring
APL for providing the shipping container for secure storage and weather protection
DOA for working with us on growth studies
GFD for providing and spraying water on the compost pile





BIOSOLIDS COMPOSTING

WHY COMPOST BIOSOLIDS?

- **SAVE** needed space in our landfill
- **GENERATE** a valuable compost product
- **REDUCE** greenhouse gas emissions from landfill

Guam EPA and partners Port Authority Guam and Landscape Management Systems Guam are conducting a demonstration project to show:

- Guam's wastewater solids can be composted with locally produced wood chips to generate high quality compost.
- Compost meets federal limits for pathogens and metals, and current guidance for polyfluoroalkyl substances (PFAS).



Website:
<http://epa.guam.gov/>

Address:
17-3304 Mariner Avenue
Tiyan Barrigada,
Guam 96913

Contact:
671.300.4751
671.300.4752

What is Sludge Cake or Cake?

Sludge cake is dewatered solids from Guam's domestic wastewater treatment plants. Every community in the United States and its territories with centralized domestic wastewater treatment generates these solids. The solids are dewatered to reduce volume and improve handling, thus creating a cake-like substance.

What's in Sludge Cake?

The composition of sludge cake depends on the type of waste water treatment process, but all sludge cake contains wastewater organics. Wastewater organics from municipal sources may contain pathogens, metals from industrial processes, and some sludge has been found to contain per- and poly-fluorinated alkyl substances (PFAS). Following treatment, testing, and meeting acceptable standards, sludge cake, or biosolids can be used as compost fertilizer for landscaping.

Valuable Uses of Cake

Biosolids compost is the product resulting from the controlled biological decomposition of the sludge cake with wood chips that has been sanitized via heat and stabilized to the point that it is beneficial for plant growth and erosion control. Compost improves soil properties physically, chemically, and biologically.

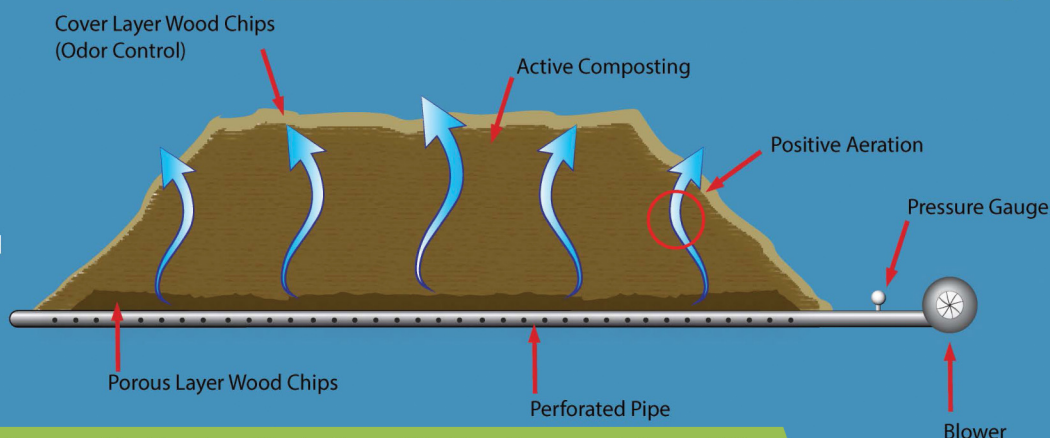
Compost uses include: landscaping amendment, erosion control, slope stabilization, nursery crop production, soil blending, turf establishment and maintenance, and weed control.

Hundreds of communities across the U.S. beneficially reuse biosolids in compost.

Metals, Pathogens, and PFAS?

Federal regulations specify treatment methods and limits for pathogens and metals that need to be met before the solids can be beneficially reused. Initial testing results for Guam's sludge cake indicate that metals and PFAS are not a concern. Pathogens are destroyed via heat in the composting process. Additional testing for metals, pathogens, and PFAS will be conducted on the sludge cake and finished compost during the demonstration project.

AERATED STATIC PILE SCHEMATIC



Information provided by Zero Waste Guam Working Group and Guam EPA.
Funded by the Guam Recycling Revolving Fund.

SAVE THE DATE

Man, Land, and Sea
Newsletter
May 1, 2020


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guam-coastal-management-program/](https://bsp.guam.gov/guam-coastal-management-program/)






#COVIDHeroesGU

Highlighting heroic COVID-19 response efforts in our local community

Use the hashtag **#COVIDHeroesGU** on your social media posts to highlight individuals, groups, and businesses who are stepping up to assist **COVID-19 response efforts** through in-kind donations of food and supplies as well as services to those working the **frontlines** of this pandemic.

A red line-art illustration showing several hands reaching up towards several hearts, symbolizing support and community.

Bureau of STATISTICS and PLANS

THE
**DATA
HUB**

WITH
TYRONE
TAITANO

Newstalk



6:30 pm Tuesdays

